

Applicant: Carnahan, Eric

Title: Reversible Heat Engine

Declaration in Support of Accompanying Petition to Make Special. Reason V and Reason VI - Enhancement of Environmental Quality and Energy Savings will result

1. I am the applicant in the above-identified patent application.

2. The invention of the above application has multiple uses and offers several benefits to mankind. Included in these benefits is a new and highly efficient means to generate power from an environmentally friendly heat source such as a solar collector. An additional benefit is a new and highly efficient means to transfer heat from a body at a low temperature to a body at a higher temperature.

3. Specifically, the invention of the above application is an improved heat engine capable of operating as either a reverse heat engine (e.g. an air conditioner, refrigerator or heat pump) if a power input is provided or as a forward heat engine producing a power output if a heat source is provided. A preferred embodiment of the invention is configured to cycle the working gas of the engine

through the Carnot cycle. The efficiencies of both the forward and reverse Carnot cycles are equal to the maximum values possible according to the second law of thermodynamics for a heat engine operating between two given temperatures.

4. When operating as reverse heat engine following the reverse Carnot Cycle, the invention will be capable of higher efficiencies than existing reverse heat engines. The vast majority of reverse heat engines in use throughout the world utilize vapor compression cycles. The maximum theoretical efficiency of a reverse heat engine following a vapor compression cycle is significantly lower than the maximum theoretical efficiency of a reverse heat engine following the reverse Carnot cycle. Thus the invention will consume less power to move a given amount of heat from a body at a low temperature to a body at a higher temperature and energy savings will result from the use of the invention.

5. For the invention to operate as a forward heat engine producing a power output a heat source must be provided to power the engine. Any heat source can be utilized to power the engine. Thus an abundant and

environmentally friendly energy source such as a solar collector could be utilized to power the engine. Additionally, because the invention operating as a forward heat engine can follow the forward Carnot cycle, a higher percentage of the solar energy collected by a solar collector can be converted to power than other forward heat engine that follow less efficient engine cycles.

6. Additionally, because a single embodiment of the invention can operate as either a forward or a reverse heat engine at any given selected moment, only one engine will need to be purchased to serve both purposes. This will improve the economic viability of the engine and further enhance its chances of success in the market place.

7. I further declare that all statements made herein of my own knowledge are true and that all statements made upon information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application and any patent issuing therefrom.

Very respectfully,

Eric Carnahan

A handwritten signature in black ink, appearing to read "Eric Carnahan", written in a cursive style.

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